REMARKS

This paper is responsive to the Office Action dated September 21, 2006 (the "Office Action").

Claims 1-46 were previously pending in the application.

Claims 1, 9, 17, 25, and 33 have been amended.

No claims added or canceled in this paper.

Accordingly, claims 1-46 remain pending.

Claims 1-46 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,026,077 issued to Iwata ("*Iwata*") in view of U.S. Patent No. 5,832,197 issued to Houji ("*Houji*"), and further in view of U.S. Patent No. 6,708,209 issued to Ebata et al. ("*Ebata*"). The amendment to claim 1 calls the Examiner's attention to a word ("the") that was added but unintentionally not marked in Applicant's previous amendment. The remaining amendments are submitted to correct matters of form in the claims. The amendments add no new matter and are supported by the Specification as originally filed. Applicant offers that the claims are allowable and respectfully requests reconsideration of the pending rejections in view of the foregoing amendments and the following remarks.

Rejections Under 35 U.S.C. § 103(a)

Applicants respectfully submit that *Iwata*, even in light of *Houji* and *Ebata* and/or the level of skill in the art at the time of invention, taken alone or in any permissible combination,

fail to show, teach or suggest the claimed invention, and that a person having ordinary skill in the art would not find a suggestion or motivation to make the proposed combination of references.

1. The cited references fail to disclose an inter-zone link that meets class of service requirements between a source zone and a destination zone.

Claim 1 reads as follows.

> 1. A method for restoring a path in a communication system between zones comprising:
> establishing an inter-zone link between a first border node of a source zone and a second border node of a destination zone, where the inter-zone link meets class of service requirements between the source zone and the destination zone;
> identifying an inter-zone link failure between the source zone and the destination zone;
> identifying a pre-planned alternative route, where the pre-planned alternative route also meets the class of service requirements between the source zone and the destination zone;
> informing a node in the destination zone of the pre-planned alternative route;
> informing a node in the source zone of the pre-planned alternative route; and
> providing communication between the destination zone and the source zone via the pre-planned alternative route.

A number of limitations of claim 1 are not present in the cited references. As a first example, claim 1 includes establishing an inter-zone link between a first border node of a source zone and a second border node of a destination zone. **"[T]he inter-zone link meets class of service requirements between the source zone and the destination zone."** The Office Action argues on p. 4 that this limitation is disclosed in the cited portions of *Ebata*. Applicant respectfully disagrees.

Ebata describes a network system that includes several networks of different organizations. Each of the several networks includes a policy server and one or more border

routers to communicate with other organizations' networks. The policy server provides a quality of service (QoS) guarantee service between end nodes. (*Ebata* at FIG. 1, 3:24-45.)

The *Ebata* policy server has a unit 320 that generates the QoS guarantee service (also termed a QoS guarantee path) between it and the other organizations. (*Id.* at 4:63—5:6, FIG. 5.) The *Ebata* system uses an "inter-organization resource policy table (322a)" that has entries for each outgoing interface of the border router of its organization. Among these entries are columns "(f)" and "(g)" that indicate upper limits (M bits/sec) of the band of the outgoing interface available for each host. (*Id.* at 6:1-21, FIG. 6.)

The *Ebata* system also uses "an intra-organization resource policy table (321a)" that is discussed among the cited portions of *Ebata*. This table 321a has entries for outgoing interfaces of the border routers that are permitted an inter-organization communication. (*Id.* at 6:61-66, FIG. 8.) FIG. 8 illustrates the table 321a, and the text of *Ebata* discusses the columns of this table 321a. Two of the columns, "c-1" and "c-2" describe upper limits of bands in *Ebata*:

> Entered in (c-1) are upper limits of the band that the hosts or the outgoing interfaces of the border routers can use in the communication via the inter-organization link IDs of (b) in response to the reservation type requests. (c-2) describes upper limits (M bits/sec) of the band that the hosts or the outgoing interfaces of the border routers can use in the communication via the inter-organization link IDs of (b) in response to the immediate type requests.

(*Id.* at 7:7-11.) This passage is in the first of three portions of *Ebata* (7:1-63) that are cited by the Office Action on p. 4 as supposedly teaching that an "inter-zone link meets class of service requirements between the source zone and the destination zone." While the Office Action does not provide a complete explanation of these cited portions, the Office Action appears to equate

the "upper limits" of bands in 7:1-63 of *Ebata* with the class of service requirements in Applicant's claim 1. This understanding misapprehends the teachings of *Ebata*.

This cited portion of *Ebata* includes an example of a band upper limit for an allocation. (*Id.* at 7:17-63.) This example makes clear that the band upper limit in *Ebata* is not used to meet class of service requirements. Rather, the band upper limit is a maximum capacity that can be carried on a link. In other words, ***Ebata*'s band upper limit is an *available* capacity. This parameter contrasts with Applicant's class of service requirements, some embodiments of which may be understood as a *required* capacity**.

Ebata's example discusses a communication between a host Ha1 and a border router BRc1, which are illustrated in FIG. 9. The communication is over a path that includes three links, named LLa1, LLa2, and La2. These links have band upper limits of 10, 5.3, and 10.0 M bits/sec, respectively. Since the links are connected in series, the maximum throughput on the resulting path is the capacity of the weakest link. *Ebata* explains that this maximum throughput is therefore 5.3 M bits/sec. (*Id.* at 7:35-46.)

The *Ebata* example also discusses a situation where two different paths are available for making a connection. (*Id.* at 7:47-63) The host Ha1 could connect to another organization through two possible choices of links, which are also shown in FIG. 9. The first choice of links is LLa1, LLa2, LLa3, LLa4, and La3. These links have varying capacities, the minimum of which is 5.3 M bits/sec. A second choice of links is also available: LLa1, LLa2, LLa3, LLa8, LLa6, and La3. These links also have varying capacities, the minimum of which is 0.5 M bits/sec. Since the first choice of links provides the greater overall throughput, it is adopted by the *Ebata* system. (*Id.* at 7:47-63.) The other choice of links provides a path

between the desired endpoints, "but this path, because it further reduces the upper limit to 0.5 (M bits/sec), is not adopted." (*Id.* at 7:60-63.)

This cited portion of *Ebata* (7:1-63) thus describes considerations that can be used in selecting among several possible paths for communication. The considerations may take into account the maximum available capacity or "band upper limit" of the individual links used in the paths. However, this cited portion merely selects the best option among various available options; it does not seek an option that meets a required criterion. Indeed, this portion of *Ebata* does not discuss any requirements for the performance of the selected path, and does not attempt to satisfy any required criteria—it merely selects the best path from among whatever paths are available. Thus, as previously stated, this cited portion of *Ebata* does not establish a link that "meets class of service requirements."

In addition, this portion of *Ebata* does not establish a link that meets "class of service requirements between the source zone and the destination zone." This additional shortcoming is evident because (1) the cited portion does not teach that any links between organizations (such as La2 or La3) are being selected at all—they are merely the only available options for communications in their respective situations, and because (2) the cited portion does not discuss any requirements that apply to the communication links between organizations. For these reasons as well, this cited portion of *Ebata* fails to establish an inter-zone link that meets class of service requirements between a source zone and a destination zone.

Still further, this portion of *Ebata* does not relate to decisions involved in establishing "an inter-zone link" that meets class of service requirements. The only decision that is made in this portion of *Ebata* (7:1-63) is the decision to select a first choice of links (LLa1, LLa2, LLa3, LLa4, and La3) over a second choice of links (LLa1, LLa2, LLa3, LLa8, LLa6, and La3). But

this selection is based only on the differences within these two choices: the first choice uses intra-organization link LLa4 instead of two intra-organization links LLa8 and LLa6. Thus, this decision involves only *intra*-organization links, and does not involve any evaluation of the *inter*-organization links. For this reason as well, this cited portion of *Ebata* fails to establish an inter-zone link that meets class of service requirements between a source zone and a destination zone.

In addition, the pending rejections rest upon the assumption that the "organizations" of *Ebata* can be understood as the zones in Applicant's claims. It is not clear that the *Ebata* organizations are zones. For example, various implementations of a zone could include components that belong to two or more organizations. In other implementations, a zone may include portions of one or more organizations.

For these reasons, Applicant submits that it is amply clear that the first cited portion of *Ebata* (7:1-63) does not disclose the limitations of establishing an inter-zone link between a first border node of a source zone and a second border node of a destination zone, "where the inter-zone link meets class of service requirements between the source zone and the destination zone." Applicant now turns to the second and third portions of *Ebata* that are cited on p. 4 of the Office Action with regard to this limitation (17:37-58 and 18:17-21).

The second portion of *Ebata* (17:37-58) cited with regard to this limitation on p. 4 of the Office Action states in part that "[f]or the communications covering multiple networks, the QoS control can be carried out not to violate the policy of each policy server of the networks through which the communications travel." The meaning of this passage can be understood by examining what the "policies" are in *Ebata*. According to the Abstract of *Ebata*, the policy for a network defines "a quality that can be guaranteed" in the network. (*Ebata* at Abstract, lines 5-7.) This aspect of *Ebata* emphasizes a point that was previously made: *Ebata* is concerned not with

an inter-zone quality of service that is *required*, but rather with evaluating the capacity that is *available* or "can be guaranteed." The second cited portion of *Ebata* thus teaches that *Ebata*'s QoS control can be used to ensure that the quality available in multiple networks is not exceeded by communications covering the multiple networks. *Ebata* thus teaches that communications are restricted to ensure that they conform to local limits. This teaching is in contrast with various embodiments of Applicant's invention, in which links are established based on the requirements of the communications. More to the point, this portion of *Ebata* decidedly does not disclose that an inter-zone link is established to meet "class of service requirements between the source zone and the destination zone."

The third and final portion of *Ebata* (18:17-21) that is cited on p. 4 of the Office Action also does not disclose this limitation. This third portion describes a unit that provides a path that has a "guaranteed quality." This guaranteed quality is within a calculation of a "quality that can be guaranteed" for the path (*id.* at 18:11-15)—in other words, it is the quality that turns out to be available on the path. Again, this feature of *Ebata* does not discuss any technique for meeting a *requirement*; it merely discloses an assessment of what is *available*. Thus, none of the three cited portions of *Ebata* disclose the limitation of establishing an inter-zone link "where the inter-zone link meets class of service requirements between the source zone and the destination zone."

Applicant also does not find this limitation in other portions of *Ebata*. Various other portions of the reference describe considerations for intra-organization links. (See, e.g., *id.* at 13:63—14:21 and 19:1-47.) However, none of these portions describe consideration for selecting inter-zone links that meet "class of service requirements between the source zone and the destination zone." As noted in the Office Action on p. 4, this limitation is also not disclosed in *Iwata*. Applicant also does not find this limitation in *Houji*, which does not discuss inter-zone links.

Since this limitations are not disclosed in the cited references, Applicant respectfully submits that independent claim 1 and all claims dependent therefrom are allowable under § 103(a). At least for similar reasons, independent claims 9, 17, 25, and 33 and all claims dependent therefrom are also allowable under § 103(a).

2. The cited references fail to disclose an inter-zone link that meets class of service requirements between a source zone and a destination zone.

As a second example of the limitations missing from the cited references, independent claim 1 includes limitations of in which **the pre-planned alternative route also meets the class of service requirements between the source zone and the destination zone**. The Office Action proposes on p. 4 that this limitation is present in *Houji*. Applicant respectfully disagrees, for at least three independent reasons.

First, *Houji* does not discuss zones or inter-zone links between a source zone and a destination zone.

Second, even if *Houji* describes of class service requirements for a pre-planned alternative route, there is no teaching that these requirements are *the same* as the class of service requirements that are met by the inter-zone link (for which the Office Action turned to the teachings of *Ebata*).

Third, *Houji* does not disclose the use of a pre-planned alternative route. *Houji* includes a description of four available paths that can be used to reach between a pair of nodes. It is not clear that the *Houji* paths are comparable with the teachings of the present application. Nonetheless, even viewed broadly, *Houji* does not disclose the use of a pre-planned alternative route. In particular, the cited portion of *Houji* explains:

In the illustrated example, there are four available paths P1 to P4 that can be used to reach from node N1 to node N5, with P1 extending through node N2, P2 through nodes N2 and N4, P3 through nodes N3, N7 and N4, and P4 through nodes N3 and N7. In addition, each signaling message contains an indication that the QOS parameter of each possible path is of the lowest value. Although multiple paths are reserved for a single connection request, the network resource occupied by the source user U1 is kept small because of the minimum QOS value of the reserved paths.

At step 22, node N1 determines whether acknowledgment messages are received from the network. If such acknowledgment messages are received, it is determined that the requests from node N1 are accepted by intermediate nodes N2, N3, N4 and N7, and flow proceeds from step 22 to step 23 where node N1 establishes paths P1 to P4 of the minimum QOS value to the destination node N5.

At step 24, source node N1 selects one of the established paths, and sends a signaling message to one of more nodes located on the selected path in order to request that the QOS parameter of the selected path be increased from the minimum value to the user-specified value. If path P1 is selected, the signaling message will be sent to node N2. Flow proceeds to step 25 to determine whether the request from node N1 is accepted by node N2. If it is, flow proceeds from step 25 to step 26 to establish a connection between source user terminal U1 and destination user terminal U2 via the selected path P1, and terminate the connection establishment routine.

(*Houji* at 2: 66—3:27.) Although this passage describes that the QOS parameter for one path (P1) is increased from a minimum value for the system to a desired user-specified value, the remaining paths are reserved with only the minimum QOS value.

Thus, although multiple paths may be reserved for a single connection request in *Houji*, this reference does not teach that these paths include an inter-zone link that meets class of service requirements between a source zone and a destination zone, and a pre-planned alternative route that also meets the class of service requirements between the source zone and the destination zone.

FIG. 3A of *Houji* emphasizes this point. As can bee seen from this figure, reproduced below, the spare paths in *Houji* are not reserved with an appropriate QOS parameter.

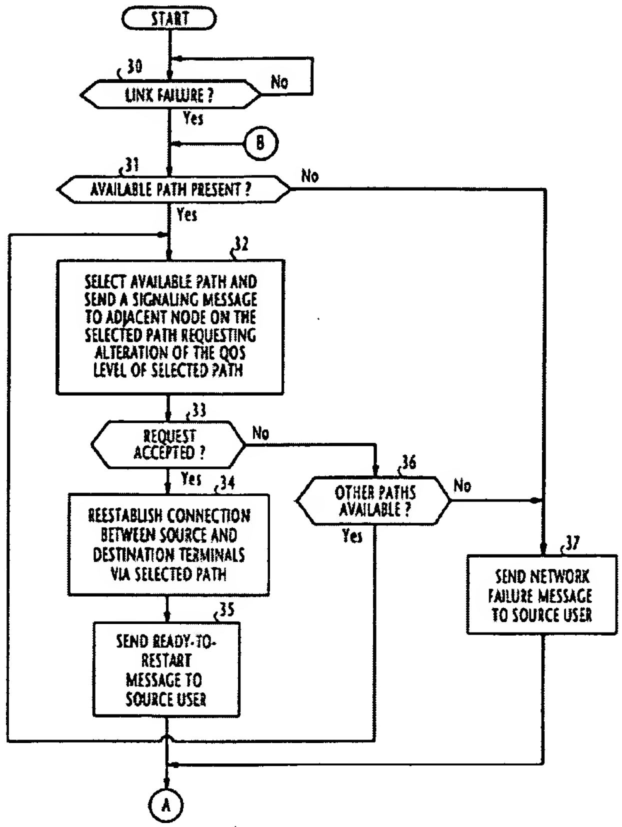

FIG. 3A of *Houji*

FIG. 3A illustrates a switching protection routine that may be used during operation of a network. It begins at step 30 when a link failure occurs. As may be seen from the figure, and as described in the cited portions of the reference, the *Houji* system checks in step 31 to see if any reserved spare paths are normal and available for use. The next steps clearly indicate that the reserved paths are not reserved or pre-planned with a required QOS parameter. Rather, the reserved spare paths in *Houji* need to be examined during the switching routine—*after* the link failure occurs—to see if they can support a user-specified QOS value. Such an approach obviously does not use a "pre-planned alternative route" as recited in Applicant's claim 1.

After selecting one of the available spare paths, the *Houji* system sends a signaling message in step 32 on the selected path requesting the alteration of its QOS parameter from the minimum value to the user-specified value. This request is necessary since the selected spare path in *Houji* is not pre-established with the desired user-specified value of the QOS parameter.

The discussion of FIG. 3A further emphasizes that *Houji* falls short of teaching Applicant's claimed invention. (*Houji* at 3:61—4:15.) This discussion indicates that it is possible that the selected available spare path will fail to support the user-specified value of the QOS parameter. In step 33, the *Houji* system queries whether the QOS request is accepted. One illustrated possibility is that the request may fail. This illustration highlights the fact that *Houji* does not perform a prior testing of the spare paths to ensure that they meet any QOS requirements.

Acknowledging the possibility that the request may fail, the diagram in FIG. 3A includes step 36, which loops the *Houji* procedure back to step 31 in an attempt to seek yet another candidate spare path. This looping and repeated testing in further clarifies that the *Houji* system requires on-the-fly searching to find an appropriate path after a failure occurs.

In contrast, various implementations of the Applicant's claimed invention may be used to avoid such searching by using a pre-planned alternative route that meets class of service requirements between the source zone and the destination zone, as set forth in claim 1. Such a route may be used, as set forth in Applicant's claim 1, to provide communication between the destination zone and the source zone while restoring a path in a communication system.

Various implementations of the Applicant's invention may use such pre-planned alternative routes to quickly enable a replacement of a failed inter-zone route with a ready alternative route. Since the Applicant's pre-planned alternative route is known to meet the

appropriate class of service requirements from the time that this route is identified, it may be possible to skip class-of-service testing after detecting a failure. The replacement of a failed route may thus be carried out comparatively quickly. A procedure for replacing the failed path may not require testing of the class of service capabilities, since the class of service requirements are checked at the time that the Applicant's alternative route is initially identified. By allowing the recovery procedure to skip such testing, the Applicant's procedure may be used to enable more rapid recoveries from path failures.

Such testing may not be skipped in systems such as *Houji*, where no prior testing is done to ensure that a spare path meets a desired class of service requirement. Without this testing, such systems may lack various advantages in some implementations of Applicant's invention. This difference arises because systems such as *Houji* lack the limitations of establishing an inter-zone link with the inter-zone link meeting class of service requirements between a source zone and a destination zone, and of identifying a pre-planned alternative route that also meets the class of service requirements between the source zone and the destination zone.

Since these limitations are not disclosed in the cited references, Applicant respectfully submits that independent claim 1 and all claims dependent therefrom are allowable under § 103(a). At least for similar reasons, independent claims 9, 17, 25, and 33 and all claims dependent therefrom are also allowable under § 103(a).

3. The cited references fail to disclose identifying an *inter*-zone link failure and identifying an *intra*-zone failure.

Applicant's independent claim 41 also includes various limitations that are not disclosed in the cited art. For example, claim 41 includes limitations of identifying an **inter-zone** link

failure and of identifying an **intra-zone** failure within at least one of said source zone and said destination zone. These limitations relate both to an *inter*-zone link failure and also to an *intra*-zone failure. Applicant respectfully submits that these limitations are not disclosed in the cited references.

The Office Action proposes on p. 6 that the link state database 102 from FIGS. 2-6 of *Iwata* teaches the identification of an intra-zone failure. Applicant respectfully disagrees.

The link state database 102 in *Iwata* is not related to the identification of intra-zone failures. *Iwata* describes this database as being included in a node control unit. (*Iwata* at 5:5-19.) With regard to the function of this database, *Iwata* discloses that the database 102 operates in conjunction with a link state routing protocol unit 101.

> The link state routing protocol unit 101 is essential protocol means for the conventional PNNI routing protocol. The link state routing protocol unit 101 exchanges hello messages with neighboring physical nodes. The link state routing protocol unit 101 thus determines whether a given link is acceptable and/or desirable for carrying a given connection between the physical node where it locates and the adjacent neighbor physical nodes. A notification is flooded throughout the same peer group. The notification contains appropriate information about a bandwidth and delay in the physical link between the adjacent physical nodes. As a result of the flooding, all the physical nodes within the same peer group note the connection topology information for all physical nodes. Likewise, the node which has been elected to perform some of the functions associated with a logical node at a higher level in the same peer group exchanges the hello message with the adjacent neighbor logical node within the peer group PG-X at a higher level or hierarchy. The elected node floods or disseminates the link state parameters for discovered adjacent neighbor topology information and a lower level or hierarchy in a compressed format. The elected node disseminates such information to the logical nodes within the peer group PG-X at the higher level. This allows the logical nodes within the peer group PG-X at the higher level to discover the connection topology information for all logical nodes. The connection topology information is flooded among

> all logical nodes within the peer groups at the lower level. The above-mentioned operation is repeated recursively for all levels of the hierarchy to exchange the hierarchical link state parameters. **The link state parameters captured by the link state routing protocol unit 101 in the manner described above are stored in the link state database 102.**

(*Iwata* at 5:23-55 (emphasis added).)

According to *Iwata*, the link state database 102 stores link state parameters captured by the link state protocol. In other portions of *Iwata*, these parameters are then used during the computation of routes. However, as may be seen from the above-quoted passage, **the link state parameters in the *Iwata* database 102 are not based on an identification of an intra-zone failure.** Further, these parameters are captured by the link state routing protocol unit 101 are gathered during regular healthy operation of the *Iwata* system: they are not indicative of failures, and in particular, they are not collected in response to an intra-zone failure.

This point may further be seen in *Iwata*'s description of the link state parameters that are stored in the link state database 102. According to *Iwata*, the parameters include "information about a bandwidth of a link and delay to discover a hierarchical topology." (*Iwata* at 2:13-22.) None of this stored information in the link state database 102 reflects the identification of an intra-zone failure. Accordingly, the link state database 102 in *Iwata* does not teach the identifying of an intra-zone failure within at least one of a source zone and a destination zone. Applicant also sees no other aspect of the cited references that disclose this limitation.

Since this limitation is not disclosed in the cited references, Applicant respectfully submits that independent claim 41 and all claims dependent therefrom are allowable under § 103(a). At least for similar reasons, independent claim 44 and all claims dependent therefrom are also allowable under § 103(a).

4. The cited references fail to disclose a source zone and a destination zone that execute separate copies of a topology distribution algorithm.

Applicant's independent claim 46 also includes various limitations that are not disclosed in the cited art. For example, claim 46 includes a limitation wherein **a source zone and a destination zone execute separate copies of a topology distribution algorithm.**

The Office Action ignores this limitation of claim 46. Applicant respectfully submits that this limitation is not disclosed in the cited references.

5. The Office Action fails to establish a motivation for the proposed combination of *Iwata* and *Houji*.

A person having ordinary skill in the art would have a motivation to make the combination of *Iwata* and *Houji* as proposed in the Office Action. The Office Action proposes the use of *Houji's* QOS parameters in the *Iwata* system. According to the Office Action, the motivation for making this combination would be to provide a feature that "performs alternate routing and avoids congestion without interrupting a connection." (Office Action at 4.) However, there is nothing in either reference (nor, in fact, in the skill in the art at the time of invention) that shows, teaches or even suggests that *Houji*'s use of QOS parameters would be particularly desirable in the setting described in *Iwata*. To suggest otherwise would be to use the Applicants' claims as a blueprint for such a rejection, and so employ impermissible hindsight.

In fact, Applicant respectfully submits that the discussion in *Iwata* is oblivious to any need for QOS considerations or for any other techniques taught in *Houji*. Neither reference includes a suggestion that one of skill in the art should look elsewhere for other restoration techniques to supplement the teachings of the individual references. *Iwata* is quite self-contained

in this regard. In a similar manner, *Houji* is similarly self-contained, providing a standalone restoration technique that would find no benefit from *Iwata* that would be particularly applicable to *Houji*'s disclosed restoration technique.

In particular, the motivation proposed in the Office Action would not lead a person having ordinary skill in the art to make the proposed combination, because *Houji* itself discusses techniques to adequately perform alternate routing to avoid congestion without interrupting a connection. The discussion in *Houji* sets forth this goal (*Houji* at 1:20-30) and then describes techniques for achieving such routing, with the additional goal of avoiding the reservation of significant amounts of network resources for each connection (*id.*). For example, such techniques are adequately set forth with the use of established paths with a minimum QOS value (*id.* at 2:66—3:15), supplemented by an after-failure request for the alteration of a QOS parameter from the minimum value to a user-specified value (*id.* at 3:51—4:4). Thus, a person having ordinary skill in the art would not have any motivation to supplement this teaching from *Houji* with the material of *Iwata*. For this reason as well, the claims are allowable under § 103(a).

6. The Office Action fails to establish a motivation for the proposed combination of *Ebata* with either *Iwata* or *Houji*.

A person having ordinary skill in the art would have a motivation to make the combination of *Ebata* with either *Iwata* or *Houji* as proposed in the Office Action. On p. 5, the Office Action proposes two motivations for making this combination. The first proposed motivation would be to provide a "quality-guaranteed path extending to a plurality of networks which has a quality guaranteed [by] the policies." The Office Action cites 2:23-27 of *Ebata* for this motivation. The second proposed motivation would be "to be guaranteed [a quality] in its

own network for an inter-network communication." For this motivation, the Office Action cites 2:5-7 of *Ebata*. Applicant submits that both of these proposed motivations are goals of *Ebata* that are squarely met by the teachings of *Ebata* itself. A person having ordinary skill in the art would find *Ebata* to be a complete reference for these teachings, and would not have a motivation to turn to another reference, such as *Houji* or *Iwata*, to supplement these teachings. For this reason as well, the claims are allowable under § 103(a).

CONCLUSION

Applicant submits that all claims are now in condition for allowance, and an early notice to that effect is earnestly solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, Virginia, 22313-1450, on December 20, 2006.

Cyrus Bharucha — Attorney for Applicant

2006 Dec 20 — Date of Signature

Respectfully submitted,

Cyrus Bharucha

Cyrus F. Bharucha
Attorney for Applicant
Reg. No. 42,324
Telephone: (512) 439-5097
Facsimile: (512) 439-5099